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Indian Standard

SPECIFICATION FOR
ALUMINIUM POLISH, PASTE FOR AIRCRAFT

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SPECIFICATION FOR ALUMINIUM POLISH, PASTE FOR AIRCRAFT

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Indian Standard

SPECIFICATION FOR ALUMINIUM POLISH, PASTE FOR AIRCRAFT

0. FOREWORD

0.1 This Indian Standard was adopted by the Indian Standards Institution on 7 December 1972, after the draft finalized by the Polishes Sectional Committee had been approved by the Chemical Division Council.

0.2 These polishes are used for polishing aluminium surfaces of aircrafts to make them glossy and to protect them from corrosion. The polish itself shall not have any ingredient that corrodes that aluminium surface unduly and a requirement is prescribed to limit the loss due to corrosion.

0.3 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS: 2-1960*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1. SCOPE

1.1 This standard prescribes the requirements and methods of sampling and test for aluminium polish, paste, meant for cleaning and polishing aircraft surfaces.

2. REQUIREMENTS

2.1 The polish shall clean and polish aluminium or aluminium alloy surfaces with a minimum of effort and shall leave no apparent scratches. Repeated applications of the polish shall improve the lustre and surface smoothness.

2.2 The polish shall contain no ingredients which may be hazardous and injurious to health under normal conditions of use.

2.3 The polish shall show no separation from the liquid phase when diluted with water according to the manufacturer's recommendations.

*Rules for rounding off numerical values (*revised*).

2.4 The polish shall have no unpleasant odour.

2.5 Flash Point—The flash point of the solvent shall be not less than 38°C when tested in accordance with the method prescribed in IS: 1448 [P: 20]-1960*.

2.6 Total Solids—The total solids shall be not less than 40 percent by mass when tested in accordance with the methods prescribed in **A-5** of IS: 5487-1969†.

2.7 Water Soluble Solvents—The relative density of the steam distillate shall not be less than 0.990 in accordance with method prescribed in **A-1**.

2.8 Alkalinity—The pH of a water extract of the polish shall be not higher than 9.0 when tested in accordance with the method prescribed in Appendix E of IS: 5480-1969‡.

2.9 Benzole—The polish shall contain no benzole when tested in accordance with method prescribed in **A-2**.

2.10 Corrosion of Aluminium—The loss in mass of aluminium, after application of the polish, shall be not greater than 25 mg/dm² per day when tested in accordance with **A-3**.

2.11 Stability—The material shall retain its consistency and shall comply with the requirements of this specification for 6 months from the date of manufacture when stored in its original sealed containers under cover at room temperature (21 to 38°C).

3. PACKING AND MARKING

3.1 Packing—The polish shall be supplied in sound, clean and dry slip-lid metal containers. The size of the containers shall be as agreed to between the purchaser and the supplier.

3.1.1 The containers shall be packed in cartons and the cartons in turn in fibreboard (cardboard) or wooden boxes or as agreed to between the purchaser and the supplier.

3.2 Marking—The following information shall be clearly indicated on the outside of the container or the cardboard cartons:

- a) Manufacturer's name and trade-mark, if any;
- b) The net weight of the material when packed; and
- c) The words 'Aluminium Polish, Paste' for aircraft.

*Methods of test for petroleum and its products: P: 20 Flash point by Abel apparatus.

†Specification for metal polish, liquid.

‡Specification for automobile polish, paste.

3.2.1 The containers may also be marked with the ISI Certification Mark.

NOTE — The use of the ISI Certification Mark is governed by the provisions of the Indian Standards Institution (Certification Marks) Act and the Rules and Regulations made thereunder. The ISI Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well-defined system of inspection, testing and quality control which is devised and supervised by ISI and operated by the producer. ISI marked products are also continuously checked by ISI for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the ISI Certification Mark may be granted to manufacturers or processors, may be obtained from the Indian Standards Institution.

4. TEST METHODS

4.1 Tests shall be carried out as prescribed in Appendix A and as indicated in 2.

4.2 Quality of Reagents—Unless specified otherwise, pure chemicals and distilled water (*see* IS:1070-1960*) shall be used in tests.

NOTE — 'Pure chemicals' shall mean chemicals that do not contain impurities which affect the results of analysis.

5. SAMPLING

5.1 Representative samples shall be drawn as prescribed in Appendix B.

A P P E N D I X A

(Clause 4.1)

METHODS OF TEST FOR ALUMINIUM POLISH, PASTE

A-1. TEST FOR WATER SOLUBLE SOLVENTS

A-1.1 Procedure—Steam distil 100 ml of polish and 100 ml of distillate is collected in a 120-ml graduated separatory funnel, the bottom stem of which is graduated into 0.2 ml divisions. The volume of insoluble volatile matter may be read directly. The relative density of the aqueous layer at 15.5°C is then determined.

A-2. TEST FOR BENZOLE

A-2.1 Procedure—Approximately 150 ml of the sample is put into a distilling flask, 150 ml of water is added and the mixture is distilled slowly, overheating of the material being avoided. The fraction (A) distilling up to 80°C is collected and the distillation is continued until an additional 60 ml of non-aqueous liquid has been obtained (B).

*Specification for water, distilled quality (*revised*).

A-2.1.1 A mixture of 170 ml phosphoric acid and 100 ml sulphuric acid is prepared. Fraction *A* is shaken in a separatory funnel with its own volume of this acid mixture. The upper layer, if there are two layers, is retained, if there is no separation of layers the fraction is discarded. Fraction *B* is treated in the same way. The upper layers from *A* and *B* are combined, washed with water and dried, first over calcium chloride and then over potassium hydroxide. The liquid is then distilled through a fractionating column. The fraction boiling between 75°C and 85°C is collected.

A-2.1.2 If there is no distillate below 85°C, benzole (benzene) is considered to be absent. If there is distillate between 75°C and 85°C, it may be identified by odour refractive index or by the procedure given in **A-2.1.3** (refractive index of benzene is 1.501, of hexane 1.375, of heptane 1.388, at 30°C).

A-2.1.3 Confirmation of the presence or absence of benzole (benzene) may be obtained by the following procedures:

After the sulphuric-phosphoric acid treatment and fractionation of hydrocarbons, 10 ml of 80°C fraction is mixed with 20 ml dimethyl sulphate. The upper layer is removed and the lower layer is distilled up to 125°C.

Three drops of this distillate are added to a mixture of 1 ml nitric acid and 1 ml sulphuric acid in a test-tube and boiled for 30 seconds. After cooling, 10 ml of water is added. A flocculent precipitate or odour of nitrobenzene indicates the presence of benzene. This precipitate is filtered off, recrystallized from 8 ml of 50 percent alcohol and the melting point determined. The melting point of *m*-dinitrobenzene is 89-90°C. (Toluene does not give either of these indications, but forms a heavy oil.)

A-3. CORROSION OF ALUMINIUM

A-3.1 Procedure—Two separate tests shall be performed; one using the paste as received, the other using the polish diluted according to the manufacturer's directions. Each test shall be performed on a sheet of aluminium. The sheets of aluminium are thoroughly cleaned and polished with the sample, following the directions given by the manufacturer. The aluminium is then thoroughly rinsed with distilled water, dried by means of a clean, soft cloth, then thoroughly degreased by wiping with carbon tetrachloride. The aluminium sheets are then accurately weighed and placed in separate wide-mouth jars. The aluminium is then completely covered (both sides) with polish to be tested (as received for one test, and diluted for the other test). The jars are tightly closed to prevent any evaporation and placed in an oven at $38 \pm 1^\circ\text{C}$. After 120 hours the aluminium sheets are removed, washed with distilled water, and then

with carbon tetrachloride as before and weighed. The area of aluminium is determined (both sides). The loss in mass in mg/dm² per day is computed from the following calculation:

$$\text{Loss in mass, mg/dm}^2 \text{ per day} = \frac{\text{Total loss in mass in mg}}{\text{Total area in dm}^2 \times 5}$$

APPENDIX B

(Clause 5.1)

SAMPLING OF ALUMINIUM POLISH, PASTE FOR AIRCRAFT

B-1. GENERAL REQUIREMENTS OF SAMPLING

B-1.0 In drawing, preparing, storing and handling test samples, the following precautions and directions shall be observed.

B-1.1 Samples shall be taken in protected place not exposed to damp air, dust or soot.

B-1.2 The sampling instrument shall be clean and dry when used.

B-1.3 Precautions shall be taken to protect the samples, the material being sampled, the sampling instrument and the containers for samples from adventitious contamination.

B-1.4 To draw a representative sample, vertical sections of the polish at uniformly placed points shall be taken and mixed as thoroughly as possible by suitable means.

B-1.5 The samples shall be placed in clean, dry and airtight glass or other suitable containers, on which the material has no action.

B-1.6 The sample containers shall be of such a size that they are almost completely filled by the sample.

B-1.7 Each sample container shall be sealed airtight after filling and marked with full details of sampling, the date of sampling and the month and year of manufacture of the material.

B-1.8 Samples shall be stored in such a manner that the temperature of the material does not vary unduly from the normal temperature.

B-2. SCALE OF SAMPLING

B-2.0 Samples to determine the conformity of a consignment of metal polish, paste to this specification shall be selected so as to be representative of the consignment. Samples drawn in compliance with an agreement

between the purchaser and supplier, to evaluate the various characteristics of the polish, shall be held to be representative of the consignment. In case of dispute the following sampling scheme is recommended to serve as a guide.

B-2.1 Lot—All the containers in a single consignment of the material drawn from the same batch of manufacture and of the same size, shall constitute a lot. If a consignment is declared or known to consist of different batches of manufacture or of different sizes of containers, the containers belonging to the same batch and size shall be grouped together and each such group shall constitute a separate lot.

B-2.1.1 Samples shall be tested for each lot for ascertaining the conformity of the material to the requirements of this specification.

B-2.2 The number (n) of containers to be selected from the lot shall depend upon the size (N) of the lot and shall be in accordance with col 1 and 2 of Table 1.

TABLE 1 NUMBER OF CONTAINERS TO BE SELECTED FOR SAMPLING

LOT SIZE	NO. OF CONTAINERS TO BE SELECTED
N	n
Up to 500	10
501 „ 1 000	15
1 001 and above	20

B-2.2.1 In addition to the number of containers selected in **B-2.2**, an additional number of containers shall be selected from each lot so as to determine corrosion and to obtain 200 g of the material for determination of the flash point of the volatile portion of the material.

B-2.3 These containers shall be selected at random from the lot (*see* IS:4905-1968*); in order to ensure the randomness of selection, some random number table as agreed to between the purchaser and the supplier shall be used. In case such table is not available, the following procedure shall be adopted:

Arrange all the containers in the lot in a systematic manner and starting from any container, count them as 1, 2, 3,....., up to r and so on. Every r th container thus counted shall be withdrawn from the lot to give a sample for test, where r is the integral part of N/n , N being the total number of containers in the lot and n the number of containers to be selected.

*Methods for random sampling.

B-3. PREPARATION OF COMPOSITE TEST SAMPLE

B-3.1 Draw with a cork borer, whose inside diameter is approximately 2 cm, vertical sections of the material from several different points of the surface of the opened containers selected according to **B-2.2**. The total quantity of material drawn from each container shall be the same and shall not exceed 50 g.

B-3.2 Thoroughly mix below 45°C with a mechanical stirrer all the portions of the material drawn from different containers so as to form a composite test sample weighing not less than 100 g.

B-4. NUMBER OF TESTS AND CRITERION FOR CONFORMITY

B-4.1 Tests for corrosion and flash point shall be done on the material collected from the containers as selected in **B-2.2.1**.

B-4.2 Tests for the determination of other characteristics (given in 2) shall be conducted on the composite sample.

B-4.3 The lot shall be declared as conforming to the requirements of this specification if the tests results as obtained under **B-4.1** and **B-4.2** satisfy the corresponding requirements.

INDIAN STANDARDS
ON
POLISHES

IS:

- 1746-1970 Shoe polish, paste (*first revision*)
- 4779-1968 Leather sole and edge wax polishes
- 5467-1969 Shellac wax
- 5468-1969 Balanco
- 5480-1969 Automobile polish, paste
- 5481-1969 Floor polish, liquid
- 5487-1969 Metal polish, liquid
- 5969-1970 Metal polish, paste
- 6045-1970 Wax-emulsion sole leather polishes
- 6271-1971 Metal polishes (special)
- 6350-1971 Shoe cream
- 6771-1972 Aluminium polish, paste for aircraft

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